

Non-Conventional Mobile Charger



Engineering

KEYWORDS : Traveling Chargers, Non-conventional Energy, Environment Friendly, Mobile Phone Market

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ABSTRACT

It's like Charging of mobile phone is a big problem when travelling a long distance journey or where power supply is not available. This paper proposes a universal mobile charger which can work on wind as well as solar energy. This charger is highly efficient and very economical as it uses non-conventional energy sources of power. During travelling, charging of mobile phone is a big problem as power supply source is not generally accessible. Traveling Chargers for Mobile Phones, iPods and MP3 players are available but they are expensive and need separate models for charging at home and in the car. So, a mobile charger using wind and solar energy is proposed. In the proposed work, wind energy is used to get 6 V with the help of generator and solar energy is used to 8 V with the help of solar panel. The proposed charger will solve the problem of mobile charging during traveling, power cut and non-availability of power at remote areas.

Introduction

In 21st century there are billions of People all across the globe are constantly using Mobile Phone. With each passing minutes hundreds of new mobile phone user are emerging. Day by day companies understanding that one of most widely used valuable assets of people are their phones and they know to make profit from these phones they need to work day and night to maintain the standards and the productivity of the company and make sure that their quality is maintained and so thus their name. So in this phenomena companies are also looking for ways to help the to provide a solution which most of the Mobile phone users are facing i.e RAPID BATTERY DISCHARGE. A recent survey has revealed that around 91% of Internet users prefer Mobiles for this Purpose,

63% of Gamers are constantly playing games on Mobiles for more than 9 hours. Around 49% of Business Personnel do their work on Mobiles. So as the battery drainage is directly proportional to mobile usage now conventionally we charge mobile phones via Electrical sockets in the house giving us bill at the end the month, as per another survey Mobile Phone charging all across the world usage around 12% of total Electrical Energy. So in the paper we propose an unconventional way which solves various problems like saving the exhaustible energy resources and providing the facility of charging in remote areas where electrical energy is unavailable. This paper targets on the transformation of mechanical energy into electrical energy to charge the mobile phone using DC Generator. Wind powered mobile charger converts wind energy into electrical energy using wind turbines.

In human powered mobile charger connecting it to, current is obtained by rotating the wheel of geared DC Generator. This kind of mobile charger is used when the power supply is not available at home or office etc. Consistent 5

volts is obtained by a LM 339 IC. Different mobiles such as Samsung, Nokia, LG, Micromax, HTC and Black Berry can be charged by using this charger. By this concept we can charge the mobile at any time by using Human powered mobile charger, while travelling using wind powered mobile charger. When the power is available mobile can be charged using 220 V supply using Electrical charger. We can choose power source for mobile charger based on our need. If we want to charge the mobile using wind energy we can disconnect and remove other power sources.

2. OBJECTIVE

The most important objective of this project was to design and build a, Non-conventional phone charger for rural communities in India. Most of rural India does not have access to reliable electricity, yet phones play a very significant role in daily life: they provide communication, entertainment, and even social status. It is critical for villagers to have their phones working even when the power is not available we came up with an idea to convert the mechanical energy of turbine into the electrical energy and store it so that it can be used whenever needed. Wind power plants can make a significant contribution to the regional electricity supply and to power supply diversification. A very short lead time for planning and construction is required as compared to conventional power projects. We realized that energy projects are flexible with regard to an increasing energy demand - single turbines can easily be added to an existing project. Finally, wind energy projects can make use of local resources in terms of labor, capital and materials. Economical objective is to reduce the manufacturing cost of the charger assembly by using non-conventional energy resource. The overall objective of the project is to understand the concept of utilizing non-conventional resource in most efficient way to the overcome the problem..

3. PROBLEM DEFINITION

The major challenge faced was in achieving a wider spread of such initiatives in rural India. There are villages where the grid has not even reached, and even electrified villages do not receive reliable and quality supply. The problem of poor electricity supply is experienced at the telecom service providers installations as well as at the customers' premises due which the consumers face consistent and prolong unsatisfactory services and their jobs face anonymous obstacles. So India being a rich country in terms of receiving solar energy provides us with great energy potential to be used for various purposes. The perennial source of solar energy provides unlimited supply, has no negative impact on the environment. The solar photovoltaic (PV) modules convert solar radiation from the sun into electrical energy in the form of direct current (DC). Converting solar energy into electricity is the answer to the mounting power problems in the rural areas. Apart from this India the best wind speed is available during monsoon from May to September and low wind speed during November to March. The annual national average wind speed considered is 5.6 m/s. Wherever average wind speed of 4.5 m/s. and above is available it is also an attractive option to supplement the energy supply. Wind power is known as 'Green Power', because of its technical and commercial viability and its environment-friendly nature. The special features of wind energy that makes it attractive are zero cost fuels, low gestation period, quicker benefits and usefulness for sustainable economic development.

4. LITERATURE REVIEW

In this project a novel method of charging mobile batteries of different manufacturers using wind power, has been designed for travelers, rural and remote areas where the current supply is not available all the time. This mobile charger is better than normal mobile charger because it has more features. The wind driven mobile charger is also portable, cost-effective and energy efficient. By further suitable modifications, the system could be used to charge gadgets for daily use. In the future work charging of laptop and high power gadgets will be accomplished. Interconnected groups of wind turbines over extended areas in order to leverage their combined energy and ensure a guaranteed minimum amount of power. There are many studies proposed to optimize the wind turbine and the solar cell power generation. Koçak (2008) focused entirely on wind speed persistence during weather forecast, site selection for wind turbines and synthetic generation of the wind speed data. Khalfallah and Koliub (2007) focused entirely on the turbine rotor and blades in order to improve the wind turbine power curves. They studied the effect of changing the rotational rotor speed on the power performance of Nordtank 300 kW regulated experimentally.

5. METHODOLOGY

Factors in consideration of project:

Compatibility with the objective, plan.

Availability of needed scientific and *ensnaring* skills in R & D.

Critical technical problems likely to emerge.

Market prospects and potential of the proposed new product.

Estimate of costs of development and production

To maximize subsidies for Telecom operators consider-

ing potential of high use of such devices in telecom sector

To examine possibilities of use of other non-conventional environment friendly energy sources.

6. AXIOMATIC DESIGN

6.1.1 WIND GENERATOR

A device that captures the force of the wind to provide rotational motion to produce power with a generator. Wind generators are "active" electricity producers. If the wind is blowing, they will produce current whether the battery bank needs the charge or not.

6.1.2 DYNAMO

A dynamo is an electrical generator that produces direct current with the use of a commutator. Dynamos were the first electrical generators capable of delivering power for industry, and the foundation upon which many other later electric-power conversion devices were based, including the electric motor, the alternating-current alternator, and the rotary converter. Today, the simpler alternator dominates large scale power generation, for efficiency, reliability and cost reasons. A dynamo has the disadvantages of a mechanical commutator. Also, converting alternating to direct current using power rectification devices (vacuum tube or more recently solid state) is effective and usually economical.

6.1.3 TRANSFORMER

A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. Electromagnetic induction produces an electromotive force within a conductor which is exposed to time varying magnetic fields. Transformers are used to increase or decrease the alternating voltages in electric power applications

6.2 GENERAL PROCEDURE

Convert Layout to Positive

EAGLE contains a schematic editor, for designing circuit diagrams. Parts can be placed on many sheets and connected together through ports. The PCB layout editor allows back annotation to the schematic and auto-routing to automatically connect traces based on the connections defined in the schematic

Imaging

Using a laser printer and toner transfer paper can allow you to get the circuit design out of the computer and onto the copper clad printed circuit board material. To conserve materials I mark an arrow on the printing side of a piece of letter sized 8.5" x 11" paper showing the feed direction. Make sure to place the toner transfer paper glossy side up.

Laminating Manufacture.

Using a band saw cut the printed circuit board material to the size of your design. After you cut out the board, sand the board edges to remove the roughness of the fiberglass. Use very fine 320 grit sandpaper to prepare the board lightly so the toner transfers properly. After the laminator heats up fully. Then using another cut strip of adhesive paper from an Avery mailing label stick the toner transfer paper with the glossy printed side against the freshly cleaned copper side of the PCB material

Etching

Place the toner transferred PCB into the etchant. Soak a disposable sponge in the ferric chloride and slowly rub the entire PCB material. Every so often dip the sponge in the

etchant to suck up more fluid. Rub the circuit board in a constant pattern for around two to three minutes until all of the unmasked copper has been etched away. A smaller circuit board will etch faster than a larger circuit board so you need to spread out your rubbing action on a larger design

Soldering

Solder all of your surface mount components first then add the through hole parts. Try and keep your time soldering surface mount components to the minimum so you don't over heat them. Solder DIP parts, resistors, capacitors etc.

6. Inspecting

Use either a microscope or magnifying glass to inspect all of the traces for any problems. A digital camera set to macro mode can also be used to inspect the board. After assembly it is a good idea to check the traces using your multi-meter in Ohms mode to look for short circuits from solder bridges on the PCB.

6.3 CIRCUIT BOARD FOR THE DESIGN



7. DESIGN CONCLUSION

The Design represents adequate behavior in standard situations without being underpinned with knowledge. This corresponds to the advanced beginner position in the Dreyfus & Dreyfus five stage-model. It effectively functions a optional 'shortcut' directly at the entrance of the powering wires from the power unit and providing charging function adequately.

8.RESULT

The results of this project can be written by studying the Characteristics of wind powered charger & advantages which are mentioned below

Some Characteristics of wind powered charger which are

Difficult Circuit Layout.

Power discharges often.

Open areas required.

Large areas required.

Requires more wind.

Simple design.

Handy and Portable Circuit.

Seamless design.

Controlling Power by RPM.

Compact.

9.CONCLUSION

The evaluation add up to a picture that allows answering previously set research questions as well as bringing forth new hypothesis and tentative answers. So from a methodological point of view, it is a productive experimental design with both explorative and a confirmative aspects. From a practitioner's point of view, it has the strong advantage of making a very close connection between research on one hand, and professional practice and professional development on the other. Also radical progress in the direction of non-conventional mobile chargers where there is unavailability of electrical supply. This has just gone to prove that a new level of innovation with sustainable resources has a huge need in energy market.

10.FUTURE SCOPE

Almost all wind energy systems require a controller to prevent damage to the turbine and the load. With advances in power electronics and microcontrollers, inexpensive yet sophisticated power controllers can be produced which are also capable of enhancing the power extraction of the overall system. These controllers may use DC-DC converters to boost the voltage of a given power source up to a higher voltage to match the requirement of a load, such as in the case of the solar panel or wind turbine operating below the charging voltage of a battery pack. A DC-DC converter, either buck or boost, may also be used in impedance matching a power source to a given load with an improvement in the overall system efficiency. With modern microcontrollers and high-frequency power switching devices a peak-power tracking controller can be developed which includes many functions such as load over charging protection, load prioritization, and turbine breaking. Such a peak-power tracking controller can greatly enhance the overall power production of a wind turbine system, and may cost a small fraction of the price of the turbine.



UNCONVENTIONAL CHARGER USING WIND ENERGY

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